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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------|-------------|----------------------|---------------------|------------------|
| 10/634,212 | 08/05/2003 | Karen Signorini | MICRON.249C1DV1 | 6861 |
| 20995 | 7590 | 03/31/2005 | EXAMINER | |
| KNOBBE MARTENS OLSON & BEAR LLP | | | DOLAN, JENNIFER M | |
| 2040 MAIN STREET | | | ART UNIT | |
| FOURTEENTH FLOOR | | | PAPER NUMBER | |
| IRVINE, CA 92614 | | | 2813 | |

DATE MAILED: 03/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/634,212 | Applicant(s) SIGNORINI, KAREN | |
| | Examiner Jennifer M. Dolan | Art Unit 2813 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-18 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 14-16 is/are allowed.
- 6) ☒ Claim(s) 11,13 and 17 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>3/14/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114.

Applicant's submission filed on 3/14/05 has been entered.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 3/14/05 was filed with an RCE on 3/14/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 11, 13, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Patent No. 6,358,756 to Sandhu et al. (cited by applicant).

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The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding the claims, Sandhu discloses a magnetic memory device (figure 5) formed on a substrate (10-12) having a conductor (16) formed therein (figure 5), comprising: a pinned layer (20) magnetized in a first direction (column 4, lines 24-35) and patterned to a first width (figure 2); a sense layer (28) that can selectively be magnetized in the first direction or a direction opposite the first direction so as to change the net resistivity of the magnetic memory device (column 1, lines 20-35; column 5, lines 1-52), wherein the sense layer is patterned to a second width less than the first width to reduce magnetic coupling between the pinned and sense layers (figure 5, column 5, lines 1-52); and a spacer (26) that is positioned about the outer lateral edge of the sense layer (figure 5) and interposed between the outer lateral edges of the sense and pinned layers (figure 5), wherein the spacer is formed of silicon nitride (column 5, lines 1-10). It is inherently the case that the sense layer can be varied by the application of an external field to thereby change the magnetic characteristics of the sense and pinned layers, since the sense layer is not "fixed" by a permanent magnet or AFM, and thus is free to rotate.

Allowable Subject Matter

5. Claims 12 and 14-16 are allowed.
6. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for allowability is that the only prior art that teaches the use of SiN, SiC, or a-C spacer layers interposed between the outer lateral edges of a pinned layer and a sense layer patterned to a smaller width than the pinned layer shares a common assignee with the present application and only qualifies as prior art under 35 U.S.C. 102 (e). Hence, U.S. Patent No. 6,358,756 to Sandhu et al., which was cited by the applicant in the IDS filed 3/14/05 and which shares a common assignee with the present application, is not usable for 103(a) rejections (see MPEP § 706.02(l)(1) and § 706.02(l)(2)). Sandhu fails to disclose the claimed elements of a tunnel layer patterned to the same width as the pinned layer (claim 12), or a sense layer formed of NiFeCo (claim 18).

Other than the Sandhu reference, the prior art fails to teach the use of a SiN, SiC, or amorphous –Carbon sidewall spacer in the claimed structure, but rather teaches the use of aluminum oxide or silicon dioxide. Since the claimed sidewalls are used as a mask structure during the patterning of the tunnel oxide layer and pinned layer in the present invention, the sidewall material must be chosen to have high etch selectivity with respect to the tunnel oxide and pinned layer, as well as fulfill the function of reducing magnetic coupling between the sense and pinned layers. Hence, the selection of materials such as SiN or SiC is critical in the present

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invention. It is the examiner's opinion that a person having ordinary skill in the art would have found no motivation in the prior art to use SiC or SiN as a sidewall spacer interposed between a pinned layer and a narrower sense layer, but rather would have simply used the conventional materials taught in the prior art.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800